SECTION 7

QUESTION 6: Based upon your technical judgment, are the available data, together with the data proposed to be obtained by USEPA, adequate for the development of a model that would meet the above referenced purposes? If not, what additional data should be obtained for these purposes?

7.1   GENERAL

Most of the data necessary for the development of an adequate model are either available or proposed to be obtained by USEPA. However, there are a number of data needs that should still be addressed. These are discussed in the following sections.

7.2   WATER COLUMN PCB PARTITIONING

The current water column partitioning data are inadequate to describe this process within the model. The methodology for collecting the samples introduces a bias as described in Section 2.2.6. Hence, partition coefficients are variable and biased high. Additionally, the sampling program did not include separate quantitation of particulate organic matter (POM). POM is necessary to determine the organic carbon fraction of suspended solids and the organic carbon-normalized PCB concentration, which controls the equilibrium dissolved-phase concentrations. Accurate determination of PCB partition coefficients requires the collection and filtration of large volumes (16-20 liters) of River water, with separate congener-specific PCB analyses and TOC analyses on the resulting particulate and dissolved phases. Procedures developed and documented in the Supplemental Investigation Work Plan for the Lower Housatonic River (Weston, 1999) should be followed for these analyses.

7.3 SEDIMENT PORE WATER MEASUREMENTS/SEDIMENT PARTITION COEFFICIENTS

The MFD presents the results of 11 sediment pore water samples for PCB analysis. These data are insufficient to describe the PCB partitioning behavior within the sediments over the modeled reach, especially considering the spatial trends observed in sediment PCB and TOC concentrations. Additionally, a number of these 11 samples do not have matched dissolved-phase PCB, dissolved organic carbon, total organic carbon, and total sediment PCB measurements. This makes interpretation of the data problematic. A sediment pore water sampling and analysis program consisting of 30-50 coupled pore water and sediment measurements of total organic carbon and congener-specific PCBs should be conducted in the River between the plant site and Woods Pond.

7.4 BED LOAD MEASUREMENTS

As discussed above, sediment bed load may be an important component of PCB transport within the system. Currently there are no direct measurements of sediment bed load in the River nor does the MFD present plans for the collection of such data. Calibration of a sediment bed load model will require bed load measurements at a number of stations and different River flow rates. Of particular importance are measurements of the incoming load at the upstream boundary of the R/FP model. Additionally, calibration and validation data, such as bed load mass/volume measurements or bed elevation changes, are required in other reaches of the River. Reach 5A, located upstream of the test reach, is where sediment bed load may have the most significant impact on PCB transport. The sediments in this reach are characterized by large grain sizes and elevated PCB concentrations. Hence, sediment bed load measurements are particularly important in this reach.

7.5   DATA ON OIL-PHASE PCBS

The conceptual model section of the MFD suggests that oil-phase PCB dissolution and transport could be potentially important PCB fate processes (MFD page 3-52, 3-65). However, as discussed above, the currently available data, including recent SEM/XRD results, do not appear to support the modeling of a separate oil phase (see Section 2.2.7). Nonetheless, if it becomes necessary to simulate an oil phase, substantial field data collection and, possibly, field and laboratory process experiments will be required to initialize and parameterize the PCB fate models.

7.6   BIOMASS DATA TO SUPPORT AQUATOX

Since AQUATOX computes biomasses of specific groups of organisms in the ecosystem, obtaining sufficient biomass data to calibrate those computations is a theoretical data need. In fact, however, as previously discussed, because the densities of many species vary considerably throughout the year and among years, sufficient data to constrain these predictions cannot feasibly be obtained, and thus the accuracy of these predictions will not be known. Accordingly, as also discussed above, these biomass calculations should not be used in the model.